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DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES  
**DIVISION OF ENVIRONMENTAL PROTECTION**

333 W. Nye Lane, Room 138  
Carson City, Nevada 89706

November 12, 2002

Mr. Dave McCarthy  
Atlantic Richfield Company  
307 E Park Ave.  
Anaconda, Montana 59711

**SUBJECT: Draft Arimetco Heap Leach and Process Components Work Plan**

Dear Mr. McCarthy:

The Nevada Division of Environmental Protection (NDEP) has received and evaluated the **Draft Arimetco Heap Leach and Process Components Work Plan**, dated August 23, 2002, regarding the continued environmental investigation of the Yerington Mine, located in Lyon County near Yerington Nevada. This office provides the following comments from NDEP, EPA, BLM, U.S. Fish and Wildlife and other technical representatives of the Yerington Technical Work Group (YTWG).

**NDEP Comments**

**NDEP General Comments**

The proposed sample quantities and locations are inadequate to defensibly characterize the various tailings areas. Sampling should not only characterize these materials for all potential constituents of concern and establish background concentrations of naturally occurring metals in soils, but also vertically delineate the characterized material. The limited sampling proposed will not provide adequate information to allow future decisions regarding vertical migration of fluids. It is inadequate to evaluate potential hazards to human health and the environment, does not establish background

concentrations of metals for comparison of analytical results, will not provide adequate information to avoid conflict and thus is not in the best interest of all parties concerned. Please propose a statistically defensible sampling plan of all tailings areas and background soil locations that will satisfy the requirements listed above.

## **NDEP Specific Comments**

### **Page 3**

Misquoted in the third paragraph. Storm water run off has been seen running into the ponds at the Slot and VLT Leach pads. Also at the Slot 1 pond, Slot 2 pond and VLT pond storm water runoff has been seen running between the primary and secondary liners. The only storm water run off witnessed from the heaps off containment, would be run off from the leach pad access ramps.

### **Page 4**

Typo end of second sentence SRK Consulting.

### **Page 6**

It is interesting that the following DQO is in this draft work plan and there is not a similar DQO in the other three work plans submitted recently. "Assessment of ecological and human health risk resulting from historical seepage of heap leach solution to groundwater below the Yerington Mine". This DQO should be a part of the ground water Work Plan and not this particular plan?

### **Page 8**

First sentence heap construction ended in 1998 not 1999.

### **Page 9**

#### **Construction**

All ore leached by Arimetco was Oxide ore not Sulfide. Also no Macarthur ore was put on the Phase I/II heap. The phase I/II heap was primarily oxide ore from the Anaconda W3 dump with a small amount of VLT. Macarthur was mined at a later date.

### **Page 10**

First sentence should be oxide ore from the Anaconda W3 dump. No Macarthur ore

## **Piping and Ancillary Features**

The Solution Drain-down reports to either a lined sump to the (south east) not west. Drain-down to the sump is pumped intermittently to the PLS pond (see Appendix D, Photo 1) not photo 5.

The last sentence in the first paragraph Meteoric water collection from the plant facilities storm water runoff.

**Page 11****Construction**

First paragraph second sentence should be oxide ore from the Anaconda W3 dump not sulfide ore. Also in addition to W3 dump material there was some Macarthur ore and VLT material leached on these two heaps.

**Page 12****Physical Description**

Third Paragraph should be oxide ore from VLT, Macarthur Pit and possibly some from the Anaconda W3 oxide dump.

**Page 13**

Second sentence. It may also report to a depressed Mega pond leak detection sump in the Anaconda Plant Site area

**Page 14****Construction**

Second paragraph Material was placed on the Slot heap between 1993 and 1998 not 1996.

Third paragraph Arimetco constructed all the pad liners, solution ditches and ponds in house with their own employees.

**Page 15**

Second paragraph is oxide ore not sulfide.

**Page 16****Construction**

First paragraph last sentence The VLT pad does cover portions of the finger evaporation ponds.

Second paragraph only the last expansion (approximately 196,000 ft.sq.) was constructed by outside contractors. Arimetco personnel did all the rest of the liners on the entire property.

**Page 17****Physical Description**

Second paragraph three types of ore were placed on the VLT heap, VLT tailings, run of mine Macarthur ore, and crushed Macarthur ore. Also note that oxide material not sulfide was excavated from the northeast corner phase III heap and placed on the outer slopes of the VLT benches to protect them from wind and /or water erosion.

## **Page 18**

First sentence evaporators are run off portable generators only. Hooking them to line power was cost prohibitive.

Existing data shows a VLT pond capacity of 3,700,000 gallons with 2 feet of free board. With no free board 4,400,000 gallons for 40 days. Based on pond monitoring it appears that we would have less than 30 days even without storm water additions.

Bottom of page the photos referenced are of the EW building only. There are no photos of the solvent extraction tanks. It may be a good idea to include an overall photo of the Arimetco plant site. It is possible to take a good picture of the facility from the top of the Phase III Leach Pad if needed. Also the multiple-stage tank referenced in the text is actually the solvent extraction tanks not Raffinate storage.

## **Figure 4**

There is an additional drain down monitoring location in the heap ditch immediately north of the slot 3 pond.

## **Figure 5**

The discharge point on the 4-inch line is the drain down monitoring location for the Phase III (4X) leach pad.

## **Appendix D**

It would be helpful to have a separate photo of each leach pad and the overall plant sit

## **EPA Comments**

### **EPA General Comments**

**Page 4, 3<sup>rd</sup> paragraph;** The background values cited in this report may represent background soil levels, however, it is premature to cite them definitively as background at this time. EPA has also collected a possible background sample, BK-1, with the results included in EPA's ?Anaconda, Yerington Mine Site Emergency Response, Assessment Final Report,? dated June 30, 2001. EPA can provide this report if needed. Appropriate background levels should be discussed in our Technical Workgroup meetings.

As mentioned in prior meetings, any known history for the heap leach and process areas should be included. At a minimum, Atlantic Richfield should review Anaconda and NDEP records, and attempt to interview past employees to determine their potential knowledge of historical usage and/or spills.

The Quality Assurance and Quality Control sections are incomplete and it is our understanding that Atlantic Richfield will be submitting a comprehensive site-wide

Quality Assurance Project Plan (QAPP) in accordance with EPA's guidance documents (EPA will provide these on request or they can be obtained from EPA's website). After review of the QAPP, the agencies will further comment on any supplementary Quality Assurance/Quality Control sections in the specific work plans. Please provide a date for submittal of the QAPP as this must be reviewed and approved prior to initiation of fieldwork.

Radionuclide screening and/or analyses should be proposed. At a minimum, all samples should be screened for radionuclides and a percentage of samples should be analyzed in the laboratory.

### **EPA Specific Comments**

**Page 1, Section 1;** The text discusses the data summary report, however, if an initial screening of the data indicates that there is a potential risk and that a risk assessment is required, where will this assessment be included?

**Page 3-4 and Table 1;** No information is provided on the Phase I, II, and III heap leach pad liners, though they were supposed to be constructed in compliance with Nevada regulations. Do the Nevada State Mining files contain any of this information?

**Page 5;** It is premature to draw conclusions regarding the homogeneity of materials in all areas and limiting the amount of sampling proposed based on this hypothesis. Sufficient sampling should be proposed to confirm this hypothesis. Uniformity must also be established with depth.

**Page 5 and Appendix A;** Note the beryllium levels in the PLS and raffinate in the October 22, 1999 analyses. These data may indicate the source for beryllium sometimes reported in well samples. If so the next question is whether such beryllium is unique to the Arimetco Leaching Operations, or whether it can, and did, also leach from Anaconda tailings. Tailings used by Arimetco and Anaconda should be collected and leached to better evaluate past and present sources for COCs to groundwater.

**Page 6, Data Quality Objectives;** The discussion regarding exposure scenarios is incomplete. In order to provide a conservative estimate of risk for comparison, the residential exposure pathway is required to be assessed for each area. This also would give an assessment of the risk any trespassers would encounter although every effort is underway to ensure that the Site is inaccessible. After the data is collected, it should be compared to screening values, such as EPA Region IX Preliminary Remediation Goals. At this time, the determination can be made as to the necessity of a risk assessment for a given area. There is also no discussion of the presence or absence of possible ecological receptors in the process area.

**Page 9, Section 2.1;** What are these conclusions based on? Where other people contacted?

**Pages 11, 13, 18, 19;** The text repeatedly concludes that "all detected leaks were contained by the secondary liner and were pumped back up to the Heap." It is not clear where the leak detention points are located, or the manner of construction. Investigations should be proposed to determine whether this hypothesis is accurate.

**Page 13, Megapond;** What is known about the construction and leak detention system for the Megapond? Was it double lined with HDPE with a leachate collection layer containing leak detectors?

**Page 20, 2<sup>nd</sup> bullet;** The text states that "records of leakage are maintained on-site." These should also be included in the workplan, preferably in a table.

**Page 21;** The list provided should also include a bullet for "evaluating whether there is any leakage beneath liners and whether the VLT materials underneath the liners are a continuing source." The former processing plant that was later covered by the "Megapond" must also be included in the investigation.

**Page 23, Material Characteristics;** How will the DQO of evaluating the potential for wind blown dust be met?

**Page 23;** Using a grain size analysis to estimate field capacity is useful. However, direct measure of what happens to precipitation falling on heap leaches should also be conducted to determine if long term infiltration and leaching will occur.

**Page 24;** One pad cannot be used as an indicator "to illustrate the effects of leakage from all solution ponds operated by Arimetco..."

**Page 24;** Eventually precipitation, evaporation, and possible infiltration will reach an equilibrium. To evaluate these conditions, data from a combination of infiltration measurements and leach characteristics can be used. It does not appear that either is proposed in this workplan.

**Page 25;** Field screening is not appropriate as the sole mechanism to screen samples for additional laboratory analysis. Field screening can be useful to focus an investigation once a contaminant has been verified by laboratory analysis. Please reconsider the sampling proposal. PID instruments do not measure concentrations in ppm. They measure in PID units. Many petroleum hydrocarbons will not generate a volatile measurable by PID. Thus, a PID can not be used to eliminate materials from consideration.

**Page 26;** A litmus paper with a pH range of 0-14 is not a good QA check on a pH meter. pH papers come in various ranges, not just 0-14 pH units.

**Page 26;** Text states that the investigation will “delineate vertical or lateral extent.” We agree with this however, the Technical Workgroup should start discussing the appropriate criteria for evaluation.

**Page 33;** It appears that Table 5 should be listed instead of Table 2.

**Figure 4;** It appears from this figure that there are no leak detection points below the secondary liner of the heap leach pads. Thus, it can not be concluded that all leaks through the primary liners were collected and directed to the ponds. Thus, it will be necessary to evaluate conditions below the heap leach pads by either drilling inclined piezometers under the pads or more easily by sampling the groundwater adjacent to the downgradient sides of the heap leaches. It is assumed that this will be done under the groundwater workplan, but it should be cross referenced in this workplan.

## **USDI/FWS Comments**

### ***USDI/FWS General Comments***

Information is needed on the potential uptake of metals and trace elements by vegetation at these sites. Some vegetation may be deeply rooted and may eventually penetrate any cover caps that may be provided on these sites. Vegetation may be consumed by wildlife or cattle, exposing them to the metals and trace elements that are taken up by the plants. Burrowing mammals may experience dermal exposure to the materials (i.e., waste rock, leach heap, or evaporation pond) if they penetrate any caps on these sites. The risks from these types of exposure should be analyzed. Information is needed on the standards and toxicity benchmarks that will be used to evaluate any data that will be collected in relation to this work plan.

### **USDI/FWS Specific Comments**

This document indicates that water may be present in unused ponds and sumps. Water may also pond on the surface of heaps. Seasonal drain down of water from heaps may also occur in relation to precipitation events. These waters should be sampled and analyzed for metals and trace elements and the data used to determine risk to wildlife, including migratory birds. Stagnant drain down water (\*see page 32) should also be sampled and analyzed because it may still be accessible to wildlife. Information is needed on the flow paths of water from these sites to determine if it will impact surface waters such as the Walker River.

We disagree with the comment in section 1.3 Previous Monitoring and Data Acquisition, Heap Material Geochemistry (page 4) that states “...surface Heap leach materials are suitable for long-term surface exposure, given the background values for the area.” The elevated concentrations of copper mercury, and selenium are not consistent with this statement.



**Section 3.3 Data Collection and Analysis Procedures, Field Measurements (page 31)** indicates that information will be collected on dissolved oxygen and color of the waters that will be sampled. However, no mention is made of these parameters in the following section (Solution Sampling) under number 4 at the bottom of page 32.

Accordingly, please provide the Draft Final Arimetco Heap Leach and Process Components Work Plan which incorporates the above comments. This information must be received not later December 12, 2002, as per approved submittal schedule.

Should you have any questions or if I can be of any assistance, please do not hesitate to contact me at (775) 687-9376 or FAX (775) 687-6396. All future correspondence regarding this subject should be addressed to the undersigned.

Sincerely,



Arthur G. Gravenstein, P.E.  
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